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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/651,820	08/30/2000	David S. Miller	PA876	2273

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Qualcomm Incorporated
Patents Department
5775 Morehouse Drive
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EXAMINER	
D AGOSTA, STEPHEN M	

ART UNIT	PAPER NUMBER
2683	12

DATE MAILED: 02/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/651,820	MILLER ET AL.	
	Examiner	Art Unit	
	Stephen M. D'Agosta	2683	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 February 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *20* is/are allowed.

6)☒ Claim(s) *1-5, 10, 12-13, 19* is/are rejected.

7)☒ Claim(s) *6-9,11 and 14-18* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.

1. New claims 6-20 have been added.

2. New art has been cited to reject some of the claims. Others identified below are objected to as well. Claim 20 is allowed.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1 and 3-5 rejected under 35 U.S.C. 103(a) as being unpatentable over Siwiak US Patent 5,640,166 in view of Sickles, II US Patent 3,940,695 and [Siwiak et al. US 5,432,521 or Dent US 5,742,908 or Ishikawa et al. US 5,613,193]. (hereafter Siwiak and Sickles and Siwiak#2 or Dent or Ishikawa).

As per **claim 1**, Siwiak teaches an apparatus for Doppler correction in a wireless communication system, wherein signals transferred within the system to receiving terminals experience a Doppler effect that varies over time in relation to a user terminal position (Title and abstract), comprising:

A first frequency synthesizer for generating a carrier signal oscillating at a rate responsive to a first input (figure 2, #222),

Wherein said rate input adjusts over time according to a predetermined sequence so that said Doppler compensation signal compensates for said Doppler effect (Claim 2, Col. 6, L44-53 states that the circuit contains a memory for storing a plurality of Doppler compensation values for minimizing Doppler frequency shifts at a plurality of predetermined points which reads on the applicant's specification which states that a memory can be used to supply the desired sequence of values for rate input and initial value, Page 10, L13-15).

But is silent on

A counter coupled to said first input for generating a Doppler compensation signal having a predetermined rate of change as Doppler changes over time , said counter having a clock input

A second frequency synthesizer coupled to said clock input for generating a clock signal oscillating at a rate responsive to a rate input, and

A rate input signal generator outputting a rate input signal coupled to said second frequency synthesizer rate input so as to adjust said rate input over time so that said Doppler compensation signal is a time varying magnitude signal with a slope that varies at a changing rate over time as to compensate for said Doppler effect at varying rates as it changes over time.

Sickles teaches the use of an up/down counter (figure 1, #34) in a Doppler correction system (title) where the output of the up/down counter is a digital signal indicative of the instantaneous contents of the counter (C3, L3-8).

Sickles also teaches the use of a clock (being connected to the up/down counter) as shown in figure 1, #38. The output of the counter eventually connects to a mixer (#86) and modulator/second synthesizer (#88). While Siwiak does not teach a clock circuit, it is evident that the overall design operates in a similar manner to that of the applicant's since data is received, the Doppler controller compensates for Doppler shift which is provided to the synthesizer and signal generator which connect to the downlink transceiver (ref. signal path in figure 2, right side of page).

With regard a clock being used that is connected to other hardware and generates a clock signal oscillating at a rate responsive to a rate input, Siwiak#2 (figure 2, #210/#220 and figure 4, #200) or Dent (figure 2, #214) or Ishikawa (figure 9, #49) each teach a similar design (eg. controllable oscillator/clock) for Doppler compensation.

Siwiak teaches a controller (figure 2, #216) that adjusts rate over time for Doppler compensation while Siwiak #2 teaches a VCO/Doppler acquisition/tracking system (figure 4, #200/300).

It would have been obvious to one skilled in the art at the time of the invention to modify Siwiak, such that a counter and second synthesizer are used, to provide an accurate measurement/count of the Doppler offset and to provide a second synthesizer that can be optimized for it's specific function (eg. its optimal frequency range is highly precise in the operational range(s) required).

As per **claim 3**, Siwiak teaches an system for frequency correcting transmissions between first and second transceivers in a wireless communication system to minimize Doppler frequency effects (title) comprising:

Carrier generating means in the first transceiver for generating a carrier signal oscillating at a rate responsive to a Doppler compensation signal (figure 2, #228)

Doppler compensation means coupled to said carrier generating means for generating ~~a~~ said Doppler compensation signal (figure 2, #216)

Rate input means coupled to said clock generating means for adjusting said rate input ~~and adjustable~~ over time so as to adjust said Doppler compensation signal to be a time varying magnitude signal with slope that varies at a changing rate over time which

compensates for said Doppler effect at varying rates as it changes over time (Claim 2, Col. 6, L44-53 states that the circuit contains a memory for storing a plurality of Doppler compensation values for minimizing Doppler frequency shifts at a plurality of predetermined points which reads on the applicant's specification which states that a memory can be used to supply the desired sequence of values for rate input and initial value, Page 10, L13-15). Siwiak teaches a controller (figure 2, #216) that adjusts rate over time for Doppler compensation while Siwiak #2 teaches a VCO/Doppler acquisition/tracking system (figure 4, #200/300).

But is silent on Clock generating means coupled to a clock input of said Doppler compensation means for generating a clock signal oscillating at a rate responsive to rate input ~~a predetermined rate.~~

Sickles also teaches the use of a clock (being connected to the up/down counter) as shown in figure 1, #38. While Siwiak does not teach a clock circuit, it is evident that the overall design operates in a similar manner to that of the applicant's since data is received, the Doppler controller compensates for Doppler shift which is provided to the synthesizer and signal generator which connect to the downlink transceiver (ref. signal path in figure 2, right side of page).

It would have been obvious to one skilled in the art at the time of the invention to modify Siwiak, such that the clock is coupled to the Doppler compensation means and generates a clock signal oscillating at a rate responsive to a predetermined rate, to provide means for the system to quickly calculate/determine and correct for Doppler shifts.

As per **claim 4**, Siwiak teaches claim 3 wherein the wireless system comprises a satellite communication system (title) including an earth-based gateway incorporating the first transceiver (figure 2, left side of page), satellite incorporating the second transceiver (figure 2, right side of page) and a user terminal (figure 2, bottom left side of page)

As per **claim 5**, Siwiak teaches a method for frequency correction of Doppler effects in a wireless communications system (title) comprising:

Generating a carrier signal oscillating at a rate responsive to a Doppler compensation signal ~~first input~~ (figure 6, #624)

Generating ~~a~~ said Doppler compensation signal having predetermined rate of change as Doppler changes over time Siwiak teaches a controller (figure 2, #216) that adjusts rate over time for Doppler compensation while Siwiak #2 teaches a VCO/Doppler acquisition/tracking system (figure 4, #200/300), based on a clock signal (figure 6, #608, #614 and #618)

Adjusting said rate input over time according to a predetermined sequence so that said Doppler compensation signal compensates for said Doppler effect (Claim 2, Col. 6, L44-53 states that the circuit contains a memory for storing a plurality of Doppler compensation values for minimizing Doppler frequency shifts at a plurality of predetermined points which reads on the applicant's specification which states that a

memory can be used to supply the desired sequence of values for rate input and initial value, Page 10, L13-15). .

But is silent on Generating ~~a~~ ***said*** clock signal oscillating at a rate responsive to a rate input.

Sickles also teaches the use of a clock (being connected to the up/down counter) as shown in figure 1, #38. While Siwiak does not teach a clock circuit, it is evident that the overall design operates in a similar manner to that of the applicant's since data is received, the Doppler controller compensates for Doppler shift which is provided to the synthesizer and signal generator which connect to the downlink transceiver (ref. signal path in figure 2, right side of page).

It would have been obvious to one skilled in the art at the time of the invention to modify Siwiak, such that the clock oscillates at a rate responsive to a rate input, to provide means for the system to quickly calculate/determine and correct Doppler shifts.

Claim 2 rejected under 35 U.S.C. 103(a) as being unpatentable over Siwiak/Sickles further in view of Jensen et al. US Patent 5,745,072 (hereafter Jensen).

As per **claim 2**, Siwiak teaches claim 1 wherein the wireless system comprises a satellite communication system (title) including an earth-based gateway (figure 2, left side of page), satellite (figure 2, right side of page) and a user terminal (figure 2, bottom left side of page)

But is silent on said frequency correction apparatus is located at said earth based gateway.

Jensen teaches a Doppler extractor located at the ground station (Figure 1).

It would have been obvious to one skilled in the art at the time of the invention to modify Siwiak, such that the frequency correction apparatus is located at said earth based gateway, to provide Doppler compensation means both on the ground and in the air.

As per claim 10, Siwiak teaches wherein rate input is updated on an infrequent basis (figure 4, microcomputer #410) contains software to schedule times for control Doppler acquisition/tracking element and VCO operation (#300 and #200).

Claim 13 rejected under 35 U.S.C. 103(a) as being unpatentable over Siwiak/Sickles further in view of Blanchard et al. US 5,874,913 (hereafter Blanchard).

As per claim 13, Siwiak teaches communication signals traverse between transmitting/receiving stations that are moving (title and abstract - teach satellite system with space-based and ground-based components, both of which can be moving/fixed

relative to each other – GEO/HEO/Synch vs. fixed/mobile ground station) **but is silent on** relative to each other resulting in said code Doppler.

Blanchard teaches Doppler compensation that computes velocity for both satellite and receiver which would be moving in relation to each other.

It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to modify Siwiak, such that transmitter/receiver velocities are calculated, to provide means to fully compute the Doppler correction required when both terminals are moving.

Claim 19 rejected under 35 U.S.C. 103(a) as being unpatentable over Siwiak/Sickles further in view of Carlsson et al. US Patent 6,665,332 (hereafter Carlsson).

As per claim 19, Siwiak teaches a method for correcting time errors manifested in response to Doppler in a communication system (title and abstract) comprising:

Pre-correcting a forward link signal such that the code timing of transmissions from a gateway by integrating the relative satellite to gateway velocity over time intervals (abstract – moving objects inherently have "velocity", eg. Doppler shifts, and are corrected by Siwiak's invention)

But is silent on Advancing or retarding the timing on signal processing elements, by a preselected fraction of the spreading code PN chip period whenever the relative satellite to gateway range increases or decrease by an amount equal to said pre-selected fraction times the speed of light.

Carlsson teaches means for determining time of arrival in each of the secondary base stations comprises despreader/demodulator means for despreading/demodulating each of the stages into Walsh codes at over sampled chip offsets (C3, L29-48) **AND** in one embodiment, a one-half chip offset from the next processing stage is used. This is done because the chip timing is unknown until sufficient integration time can reveal a peak in the time-frequency cross ambiguity function. The uncertainty in timing is a function of the unknown propagation distance, and thus determines the number of stages M. To find a suitable value for M, the maximum expected-propagation time must

be estimated. From this, the number of chip offset stages over which to search may be determined as follows: ##EQU3## Tc=Chip Duration (seconds) c=speed of light (3*10.sup.8 m/s) d=maximum expected propagation distance (meters) N=chip over sampling rate (C8, L28-48).

It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to modify Siwiak, such that Advancing or retarding the timing on signal processing elements, by a preselected fraction of the spreading code PN chip period whenever the relative satellite to gateway range increases or decrease by an amount equal to said pre-selected fraction times the speed of light, to provide means for Doppler compensation by a small fraction of spreading code.

Allowable Subject Matter

Claim 20 allowed – prior art cited does not disclose Doppler compensation in a communication system employing CDMA spread spectrum modulated signals comprising: Modulating a data signal using a coding clock signal so as to produce a coded data signal, and Modulating said coded data signal by a pre-corrected carrier signal to form a pre-corrected transmission signal and Modulating said coded data signal by a second pre-correction modulation to independently generate a pre-corrected coding clock signal when the carrier frequency is not a multiple of the code rate.

Claims 6-9, 11 and 14-18 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen M. D'Agosta whose telephone number is 703-306-5426. The examiner can normally be reached on M-F, 8am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Trost can be reached on 703-308-5318. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SMD
2-20-04

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